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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/536,856

11/22/2006

Timothy M. Spitler

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EXAMINER

HOLT, ANDRIAE M

ART UNIT

PAPER NUMBER

1616

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03/17/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/536,856	<b>Applicant(s)</b> SPITLER, TIMOTHY M.	
	<b>Examiner</b> Andriae M. Holt	<b>Art Unit</b> 1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Claims 1-20 are pending in the application. Claims 1-20 will presently be examined to the extent they read on the elected subject matter of record.

#### ***Priority***

This application is a 371 of PCT/US03/38235 filed December 2, 2003, which claims priority the U.S. Provisional Application No. 60/430,284 filed December 2, 2002.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantrell et al. (US 6,403,523).

#### ***Applicant's Invention***

Applicant claims a rare-earth compound selected from the group consisting of rare earth anhydrous oxycarbonate and rare earth hydrated oxycarbonate, with a surface area of at least 10 m<sup>2</sup>/g, suitable for removal of phosphate from water. Applicant also claims the rare earth compound is manufactured as agglomerates of 1 to 1000 µm in size.

***Determination of the scope of the content of the prior art  
(MPEP 2141.01)***

Cantrell et al. teach that rare earth oxides have been used as catalysts for methane coupling at atmospheric pressure in many studies. They have been prepared from a variety of rare earth compounds, such as carbonates, hydroxides, nitrates, acetates, and oxalates, by calcination at high temperature in air or another atmosphere, such as nitrogen or helium. The phase composition of these catalysts is known to be highly dependent on the preparation method. Lanthanum oxide in particular is sensitive to exposure to atmospheric water vapor and carbon dioxide, which can convert the oxide over time to a partially carbonated hydroxide. Hydration and carbonation can also occur during catalysis. Commercially prepared oxides are often recalcined as received or after hydrothermal treatment before they are used as catalysts. The surface area of the prepared catalyst generally ranges from 3 to 10 m<sup>2</sup>/g, with some higher or lower values reported. Surface area decreases with higher calcination temperature and during reaction (col. 3, lines 21-38). Cantrell et al. teach that unlike catalysts in the prior art, the catalysts exhibit high selectivity for the oxidative dehydrogenation of lower hydrocarbons at elevated pressure (col. 12, lines 16-18). Cantrell et al. further teach that unlike catalysts in the prior art, which can be utilized at the elevated temperatures that are necessary to obtain high activity at low pressure, which are generally in the range of 600° to 900° C, the nonstoichiometric rare earth oxycarbonate catalysts have the property that the catalyst becomes unselective for the oxidative dehydrogenation reaction at elevated temperature, which generally occurs in the range of about 600° C to about 750° C., and frequently occurs in the range of about 650° C. to about 700° C (col.

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12, lines 38-50). This property is illustrated for a nonstoichiometric lanthanum oxycarbonate catalyst in FIG. 6 (lanthanum oxycarbonate) (col. 12, lines 51-52).

Cantrell et al. teach one method for preparing a nonstoichiometric rare earth oxycarbonate catalyst having a disordered and/or defect structure comprises, in general, the steps of first forming a catalyst precursor and then forming a catalyst from the catalyst precursor at elevated pressure (col. 19, lines 2-6). Cantrell et al. teach the catalyst precursor is formed from at least one rare earth compound that includes at least one rare earth element selected from the group consisting of La (lanthanum). The one rare earth compound is treated with at least water and/or an organic compound that contains a hydroxyl group (col. 12, lines 26-27). The treated rare earth compound is then dried and drying methods that are known to one skilled in the art may be used (col. 19, lines 45-50). The treated rare earth compound is then calcined at a temperature in the range of about 300° C to about 1000° C in an atmosphere containing oxygen. (col. 19, lines 66-67-col. 20, line 1).

***Ascertainment of the difference between the prior art and the claims***

***(MPEP 2141.02)***

Cantrell et al. do not teach the rare-earth compound is suitable for the removal of phosphate from water or the process of making the rare-earth compound.

***Finding a prima facie obviousness  
Rationale and Motivation (MPEP 2142-2143)***

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Cantrell et al. and use the compounds to remove

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phosphate from water because the rare-earth compounds are the same as the compounds of the instant application. Therefore, the skilled artisan would have been motivated to use the compounds to remove phosphate from water because the compounds are identical. Where the claimed and prior art product(s) are identical or substantially identical, the burden of proof is on applicant to establish that the prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best*, 195 USPQ 430.

Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show the same process of making, see *In re Brown*, 173 USPQ 685, *In re Fessmann*, 180 USPQ 324, *In re Spada*, 15 USPQ2d 1655, *In re Fitzgerald*, 205 USPQ 594 and MPEP 2113.

Therefore, the claimed invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made because every element of the invention has been fairly suggested by the cited reference.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cantrell et al. (US 6,403,523) in view of Kulperger et al. (US 6,338,800) and Mills (US 5,683,953).

***Applicant's Invention***

Applicant claims a rare-earth compound selected from the group consisting of rare earth anhydrous oxycarbonate and rare earth hydrated oxycarbonate, with a surface area of at least  $10 \text{ m}^2/\text{g}$ , suitable for removal of phosphate from water. Applicant also claims the rare earth compound is manufactured as agglomerates of 1 to  $1000 \text{ }\mu\text{m}$  in size.

***Determination of the scope of the content of the prior art  
(MPEP 2141.01)***

The teachings of Cantrell et al. with respect to the 35 U.S.C. 103(a) rejection is hereby incorporated and are therefore applied in the instant rejection as discussed above.

***Ascertainment of the difference between the prior art and the claims  
(MPEP 2141.02)***

Cantrell et al. do not teach the rare-earth compound is suitable for the removal of phosphate from water or a method of preventing algal growth in swimming pools . It is for this reason Kulperger et al. is added as a secondary reference.

Kulperger et al. teach a partially soluble lanthanide compound and methods for use in removing phosphate from water. Preferably the compound is used in removing phosphate from water in swimming pools, spas, and similar structures (Abstract). Kulperger et al. teach the composition includes a slurry of one or more rare earth salts in water. Preferably, the rare earth salt is a lanthanide compound, even more preferably the rare earth salt is lanthanum sulfate (col. 4, lines 63-67-col. 5, lines 1-10). Kulperger

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et al. teach these methods can be used to reduce undesirably elevated levels of phosphate as part of the water quality maintenance for a pool or other facility. The methods that have proved successful in treating elevated phosphate levels include first measuring the concentration of phosphate in the water.

Mills teaches methods and compositions for treating swimming pool waters in order to remove one or more nutrients necessary for algal growth and to accelerate the breakdown of objectionable chloramines within chlorinated pool waters. Mills further teaches the target nutrients of preference are those containing phosphorus or nitrogen. Phosphorus nutrients are preferably removed by ion-exchange with finely divided lanthanum carbonate, or by direct precipitation in the pool with liquid lanthanum chloride (Abstract). Mills teaches ideally catalysts for such reactions in pool water will have two possible oxidation states at about pH 7 which can be switched by nitrogen and chlorine ions to break down chloramines. Lanthanide elements, such as cerium, praseodymium, terbium and lanthanum can switch between +4 and +3 oxidation states at about neutral pH (col. 3, lines 15-24). Mills teaches the particles of unclassified commercial-grade powders can be agglomerated into clumps larger than 100  $\mu\text{m}$  (and, preferably, less than 2500  $\mu\text{m}$ ) and used in the same manner as the classified composition. Alternatively, the agglomerated composition may be added the pool filter (col. 3, lines 56-65). Mills teaches fine reagent particles may be agglomerated with larger and essentially inert porous carrier particles, such as those of diatomaceous earth. Preferably, the conglomerate particles are at least 100  $\mu\text{m}$  in size (col. 3, lines 66-67).



***Finding a prima facie obviousness***  
***Rationale and Motivation (MPEP 2142-2143)***

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Cantrell et al., Kulperger et al., and Mills and use the rare-earth compound for the removal of phosphate from water or a method of preventing algal growth in swimming pools. One skilled in the arts at the time the invention was made would have been motivated to use the rare earth compound to remove phosphate from water because the compounds taught by Cantrell et al. are the same compounds claimed in the instant application. Therefore, the properties possessed by the compounds of the instant application, ability to remove phosphate from water would be possessed by the prior art. Where the claimed and prior art product(s) are identical or substantially identical, the burden of proof is on applicant to establish that the prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best*, 195 USPQ 430.

In reference to claims 6-17, the claims are a process of making the rare-earth compound and are product-by-process claims. Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show the same process of making, see *In re Brown*, 173 USPQ 685, *In re Fessmann*, 180 USPQ 324, *In re Spada*, 15 USPQ2d 1655, *In re Fitzgerald*, 205 USPQ 594 and MPEP 2113.

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One skilled in the art at the time the invention was made would have been motivated to use the rare-earth compound to remove phosphate from water and in a method of preventing algal growth in swimming pools because Kulperger et al., and Mills each teach that rare-earth compounds, particularly lanthanum carbonate are used to remove phosphate from water which serves as a nutrient for algae in swimming pools. As such, the skilled artisan would be motivated to try a lanthanum anhydrous or hydrated oxycarbonate to remove phosphate from water and prevent algal growth in swimming pools with a reasonable expectation of success because the rare-earth metal, lanthanum is known to remove phosphate water and prevent algal growth.

Therefore, the claimed invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made because every element of the invention has been fairly suggested by the cited reference.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyawaki et al. (US 5,407,560).

### ***Applicant's Invention***

Applicant claims a rare-earth compound selected from the group consisting of rare earth anhydrous oxycarbonate and rare earth hydrated oxycarbonate, with a surface area of at least  $10 \text{ m}^2/\text{g}$ , suitable for removal of phosphate from water. Applicant also claims the rare earth compound is manufactured as agglomerates of 1 to 1000  $\mu\text{m}$  in size.

***Determination of the scope of the content of the prior art  
(MPEP 2141.01)***

Miyawaki et al. teach rare earth metal compounds which are soluble in heavy petroleum oils are preferable. They may be added to heavy petroleum oils either directly or dissolved in an organic hydrocarbon oil, such as aromatic hydrocarbon, kerosene fraction, ester, polyoxyalkylene glycol, or the like with a comparatively high boiling point such as such as 250° C or higher (col. 3, lines 22-29). Miyawaki et al. further teach given as other rare earth metal compounds are inorganic compounds such as carbonates, e.g.,  $\text{Ce}_2(\text{CO}_3)_3$ ,  $\text{La}_2(\text{CO}_3)_3$ , oxycarbonates, etc., e.g.,  $\text{Ce}_2\text{O}(\text{CO}_3)_2$ , and  $\text{La}_2\text{O}(\text{CO}_3)_2$ , hydroxides, or their hydrates.

***Ascertainment of the difference between the prior art and the claims  
(MPEP 2141.02)***

Miyawaki et al. do not teach the rare-earth compound is suitable for the removal of phosphate from water or the process of making the rare-earth compound.

***Finding a prima facie obviousness  
Rationale and Motivation (MPEP 2142-2143)***

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Miyawaki et al. and use the compounds to remove phosphate from water because the rare-earth compounds are the same as the compounds of the instant application. Therefore, the skilled artisan would have been motivated to use the compounds to remove phosphate from water because the compounds are identical. Where the claimed and prior art product(s) are identical or substantially identical, the burden of proof is on applicant to establish that the prior art

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product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best*, 195 USPQ 430.

Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show the same process of making, see *In re Brown*, 173 USPQ 685, *In re Fessmann*, 180 USPQ 324, *In re Spada*, 15 USPQ2d 1655, *In re Fitzgerald*, 205 USPQ 594 and MPEP 2113.

Therefore, the claimed invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made because every element of the invention has been fairly suggested by the cited reference.

None of the claims are allowed.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDRIAE M. HOLT whose telephone number is (571)272-9328. The examiner can normally be reached on 7:00 am-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richter Johann can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Patent Examiner  
Art Unit 1616

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